

GENERAL CONSTRUCTION NOTES:

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING CODE. THE PUBLICATIONS LISTED BELOW ARE THE GOVERNING CODES AND STANDARDS AND ARE REFERENCED BY THEIR BASIC DESIGNATION. IN THE CASE OF CONFLICTING REQUIREMENTS, THE BUILDING CODE SHALL GOVERN.
- CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES AND FIELD CONDITIONS PRIOR TO ANY DEMOLITION, FABRICATION, CONSTRUCTION OR INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS, MATERIALS, SIZES AND DIMENSIONS ARE DIFFERENT FROM THOSE SHOWN.
- THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS OTHERWISE INDICATED, THEY DO NOT INDICATE THE MEANS OR METHOD OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF THE STRUCTURE DURING ALL PHASES OF DEMOLITION, CONSTRUCTION, AND INSTALLATION. PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKMEN OR OTHER PERSONS BY MEANS OF SHORING, BRACING, ETC. AS A PART OF THIS RESPONSIBILITY, RETAIN THE SERVICES OF A LICENSED STRUCTURAL ENGINEER TO DESIGN AND SUPERVISE ANY SCAFFOLDING FOR WORKMEN AND ALL SHORING AND ELEMENTS OF CONSTRUCTION.
- DETAILS AND CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS SHOWN FOR SIMILAR CONDITIONS AND MATERIAL.
- SHOP DRAWINGS PREPARED BY SUPPLIERS, SUB-CONTRACTORS, ETC. SHALL BE REVIEWED, COORDINATED AND SIGNED/STAMPED BY GENERAL CONTRACTOR PRIOR TO SUBMITTING TO THE ENGINEER.

APPLICABLE CODES AND STANDARDS:

BUILDING CODE	INTERNATIONAL BUILDING CODE (IBC), 2006 EDITION, INCLUDING THE STATE OF MINNESOTA BUILDING CODE AMENDMENTS.
ACI 318	AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"2005 EDITION

DESIGN LOADS

- BASED ON THE MEMBER SIZES, REINFORCING SIZES, TESTING DATA FROM 1997 ETC. THE EXISTING STRUCTURE, WITH NEW BONDED STRUCTURAL TOPPING HAS BEEN DESIGNED FOR THE FOLLOWING SUPER-IMPOSED LOADS.
 - 50 PSF LIVE LOAD WITHOUT WHEEL LOADS.
 - ¾ TON VEHICLE, ADJACENT TO A 36,000# PUMPER VEHICLE WITH AXLE SPACING APPROXIMATELY 19'-0". FRONT AXLE LOADING OF 17,100# (SINGLE TIRES), 20,430# REAR AXLE LOADING (DUAL TIRES)

DESIGN CRITERIA LOADS AND STRESSES:

A. CONCRETE:

- MIXING, BATCHING, TRANSPORTING, PLACING, AND CURING OF ALL CONCRETE, AND SELECTION OF CONCRETE MATERIALS, SHALL CONFORM TO ACI 301. "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS." EXCEPT AS NOTED BELOW. PROPORTIONS OF AGGREGATE TO CEMENTITIOUS PASTE SHALL BE SUCH AS TO PRODUCE A DENSE, WORKABLE MIX THAT CAN BE PLACED WITHOUT SEGREGATION OR EXCESS FREE SURFACE WATER.
- ALL CONCRETE USED IN HORIZONTAL SURFACES EXPOSED TO THE WEATHER SHALL CONTAIN AN ACCEPTABLE ADMIXTURE TO PRODUCE AIR-ENTRAINED CONCRETE WITH TOTAL AIR CONTENT, AS NOTED IN THE CONCRETE MIX SPECIFICATION TABLE. TOLERANCE FOR AIR CONTENT SHALL BE +/-1 PERCENT. AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK. IF CONCRETE IS PUMPED, AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP LINE. TESTS FOR AIR CONTENT SHALL MEET ASTM C172 REQUIREMENTS.
- MIX DESIGNS LISTED BELOW SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO USE. SUBMITTALS SHALL INCLUDE TEST DATA THAT CONFIRMS THE STRENGTH OF EACH MIX PER ACI 318 CHAPTERS 5. SELECTION OF CONCRETE MIX PROPORTIONS SHALL BE IN ACCORDANCE WITH ACI 301. MIX PROPORTIONS SHALL MEET OR EXCEED THE REQUIREMENTS LISTED BELOW FOR THE LOCATIONS NOTED. THE MORE STRINGENT OF THE REQUIREMENTS LISTED SHALL GOVERN.
- MAXIMUM SIZE OF AGGREGATE SHALL BE AS LISTED BELOW. MAXIMUM FLY ASH AS A PERCENTAGE OF TOTAL WEIGHT OF CEMENTITIOUS MATERIAL SHALL BE 30 PERCENT. FLY ASH SHALL BE CLASS C OR F, MEETING ASTM C618 REQUIREMENTS. WATER/CEMENT RATIO SHALL BE BASED ON TOTAL CEMENTITIOUS MATERIAL, INCLUDING FLY ASH AND OTHER POZZOLANIC MATERIALS.
- THE CONTRACTOR SHALL DETERMINE SLUMP. EACH CONCRETE MIX SUBMITTED SHALL HAVE THE SLUMP SPECIFIED. SLUMP SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK. IF CONCRETE IS PUMPED, SLUMP SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP LINE. SLUMPS SHALL BE WITHIN +1 INCH AND -2 INCHES OF THE SPECIFIED SLUMP.
- THE USE OF SUPER PLASTICIZERS AND WATER REDUCERS IS ALLOWED, BUT NOT REQUIRED. ALL ADMIXTURES SHALL BE CHLORIDE FREE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CONCRETE MIX DESIGN TABLE				
LOCATION	f' _c (PSI)	TEST AGE (DAYS)	MAX W/C RATIO	AIR CONTENT (%)
SILICA FUMED CONCRETE	5,000	28	0.44	6.5

B. REINFORCING STEEL:

- 60,000 PSI ASTM A615 GRADE 60 DEFORMED REINFORCING (EPOXY COATED UNLESS NOTED OTHERWISE.)
- SEE WORK ITEM #2 (NOTE 10) FOR COATING OF REINFORCING.
- SEE WORK ITEM #6 FOR CONCRETE ADMIXTURE MATERIALS.
- WELDING OR TACK WELDING OF REINFORCING BARS TO OTHER BARS OR TO PLATES, ANGLES, ETC. IS PROHIBITED, EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER. WHERE WELDING IS APPROVED, IT SHALL BE DONE BY AWS CERTIFIED WELDERS USING E6018 OR APPROVED ELECTRODES. WELDING PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.4.

STRUCTURAL STEEL WELDING

- STRUCTURAL STEEL SHOP DRAWINGS SHALL SHOW ALL WELDING WITH AWS A2.4 SYMBOLS.
- ALL WELDING SHALL BE DONE BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH AWS D1.1. WELDS SHOWN ON THE DRAWINGS ARE THE MINIMUM SIZES. INCREASE WELD SIZE TO AWS MINIMUM SIZES, BASED ON PLATE THICKNESS. THE MINIMUM WELD SIZE SHALL BE 3/16" INCH.
- PROPER FIELD WELDING PER AWS D1.1 SHALL BE USED. WHERE NO FIELD WELDING SYMBOLS ARE SHOWN, IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE USE OF SHOP AND FIELD WELDS.
- ALL WELDS SHALL BE MADE USING LOW HYDROGEN ELECTRODES WITH MINIMUM TENSILE STRENGTH PER AWS D1.1 (MINIMUM 70 KSI). LOW HYDROGEN SMAW ELECTRODES SHALL BE USED WITHIN 4 HOURS OF OPENING THEIR HERMETICALLY SEALED CONTAINERS, OR SHALL BE REDRIED PER AWS D1.1, SECTION 4.5. ELECTRODES SHALL BE REDRIED NO MORE THAN ONE TIME, AND ELECTRODES THAT HAVE BEEN WET SHALL NOT BE USED.
- ALL WELDING SHALL BE PERFORMED IN STRICT ADHERENCE TO A WRITTEN WELDING PROCEDURE SPECIFICATION (WPS) PER AWS D1.1. ALL WELDING PARAMETERS SHALL BE WITHIN THE ELECTRODE MANUFACTURER'S RECOMMENDATIONS. WELDING PROCEDURES SHALL BE SUBMITTED TO THE OWNERS TESTING AGENCY FOR REVIEW BEFORE STARTING FABRICATION OR ERECTION. COPIES OF THE WPS SHALL BE ON SITE AND AVAILABLE TO ALL WELDERS AND THE SPECIAL INSPECTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE JOINT PREPARATIONS AND WELDING PROCEDURES THAT INCLUDE, BUT ARE NOT LIMITED TO: REQUIRED ROOT OPENINGS, ROOT FACE DIMENSIONS, GROOVE ANGLES BACKING BARS, COPES, SURFACE ROUGHNESS VALUES, AND TAPERS AND TRANSITIONS OF UNEQUAL PARTS.

CONCRETE SURFACE PREPARATION: WORK ITEM #1

- ALL DECK PREPARATION BY SHOT OR WATER BLASTING.
- ALL CURB PREPARATION BY AIR AND WATER BLAST.
- PRESSURE WASH ALL INDICATED SURFACES USING 3000-4000 PSI WATER BLAST, AS REQUIRED TO REMOVE ALL EXISTING LOOSE TRAFFIC COATING, DUST, DIRT AND DEBRIS. ABRASIVE SHALL BE USED IN COMBINATION WITH WATER WHEN CLEANING REPAIR CAVITIES, AS REQUIRED TO ELIMINATE MICRO-CRACKED SURFACE MATERIALS. RESULTING FROM DEMOLITION. NO WATER WITH CONCRETE DUST SHALL BE ALLOWED TO REMAIN ON ANY SURFACE FOLLOWING WASHING, AND MUST BE IMMEDIATELY REMOVED, PRIOR TO DRYING AND REHARDENING.
- THE RESULT OF THIS PREPARATION SHALL RENDER A SURFACE CLEAN, MEANING HAVING COMPLETE EXPOSURE OF SOUND ORIGINAL MATERIAL WITHOUT ANY DEPOSITS OF CONTAMINANTS, FOREIGN MATTER OR LOOSE MATERIAL, WHICH COULD AFFECT THE BOND OR LONG-TERM DURABILITY OF THE SURFACE AND THE PATCHING COMPOUND.

CONCRETE / SPALL REPAIR PREPARATION: WORK ITEM #2

- REMOVE EXISTING UN-BONDED CONCRETE TOPPING SLAB AS NOTED AND DELIMATED ON PLANS
- LOCATE AND MARK THE DELAMINATED AREAS OF THE CONCRETE STRUCTURAL SLAB SURFACE.
- REMOVE ALL UNSOUND AND DELAMINATED CONCRETE BY CHIPPING. THE CHIPPING TOOL SHALL HAVE A MAXIMUM WEIGHT OF 30 POUNDS. EXERCISE CARE TO PREVENT DAMAGING SOUND CONCRETE. DO NOT CHIP NEAR NEW CONCRETE PATCHES LESS THAN 28 DAYS OLD.
- TAKE EXTREME PRECAUTION NOT TO DAMAGE THE REINFORCING STEEL. THE CONTRACTOR MAY BE REQUIRED TO REPLACE ANY DAMAGED EXISTING REINFORCING STEEL PER REINFORCING STEEL BAR REPLACEMENT: WORK ITEM #6
- TAKE PRECAUTION WHEN WORKING IN THE PROXIMITY OF THE EMBEDDED ELECTRICAL JUNCTION BOXES AND CONDUITS. THIS WORK MUST BE COORDINATED WITH THE BUILDING OR STRUCTURE'S ELECTRICIAN.
- REMOVE THE CONCRETE AS NECESSARY TO COMPLETELY EXPOSE THE REINFORCING STEEL AND PROVIDE A SPACE 3/4" BEHIND THE REINFORCING STEEL OR AS NECESSARY TO PROVIDE A MINIMUM DEPTH FOR THE PATCH OF 2", WHICHEVER IS GREATER. PROVIDE A SOUND FRACTURED-AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE VARIATION OF "+-1/4". DO NOT OPERATE CHIPPING HAMMER AT MORE THAN A 45 DEGREE ANGLE.
- SAW CUT THE EDGES OF THE PATCH AREA TO A MINIMUM DEPTH OF 1/2" OR TO THE TOP OF THE REINFORCING STEEL IF THE REINFORCING STEEL IS WITHIN 1/2" OF THE SURFACE. EXERCISE CARE TO PREVENT CUTTING THE REINFORCING STEEL. INSURE THAT SAW CUT LINES ARE PLACED SOME DISTANCE OUTSIDE THE LIMIT OF THE SPALLING TO MAKE SURE ALL DEFECTIVE CONCRETE IS REMOVED AND THE REPAIR IS BONDED TO SOUND MATERIAL. ALL EDGES (SAW CUT OR CHIPPED) MUST BE PERPENDICULAR TO THE SURFACE. CONCRETE WITHIN THE AREA OF THE SAW CUT SHALL BE CHIPPED AWAY TO EXPOSE SOUND CONCRETE OR TO A MINIMUM DEPTH OF 2", WHICHEVER IS GREATER OVER THE ENTIRE AREA.
- AFTER CHIPPING HAS BEEN COMPLETED, THE ENTIRE AREA SHALL BE SANDBLASTED TO REMOVE ANY FOREIGN PARTICLES FROM THE CONCRETE AND TO REMOVE ALL RUST AND SCALE FROM THE REINFORCEMENT. AFTER THE REINFORCING HAS BEEN FULLY EXPOSED AND CLEAN, A CHECK OF STEEL DETERIORATION SHOULD BE MADE. IF THE CROSS-SECTIONAL AREA OF THE STEEL HAS BEEN REDUCED BY AS MUCH AS 15%, ADDITIONAL REINFORCEMENT IS REQUIRED.
- IF SIGNIFICANT CORROSION OF THE EXISTING REINFORCING STEEL HAS OCCURRED, REFER TO NOTES PER THE REINFORCING STEEL WORK ITEM #6 AND PER TYPICAL LAP DEVELOPMENT SPLICE DETAILS.
- CLEAN THE PATCH AREA TO REMOVE ALL LOOSE PARTICLES AND DUST BY VACUUMING OR BLOWING OUT WITH COMPRESSED AIR. IF COMPRESSED AIR IS USED, THE COMPRESSOR SHALL HAVE A FUNCTIONING OIL TRAP. THE ENGINEER SHALL OBSERVE AND APPROVE THE PREPARATION OF THE PATCH AREAS BEFORE PATCHING MATERIAL IS PLACED IN THAT AREA. THE ENGINEER SHALL VERIFY THE SQUARE FOOTAGE AND/OR LINEAR FEET OF REPAIR WORK AND THE AMOUNT OF ADDED REINFORCING STEEL FOR PAYMENT PURPOSES.
- FULLY COAT THE EXISTING REINFORCING STEEL BARS AND/OR MESH AND CUT ENDS NEW EPOXY COATED STEEL BARS OF WITH AN APPROVED PRODUCT LISTED BELOW:
 - *ARMATEC 110 EPOCEM BONDING AGENT/ ANTI-CORROSION COATING "BY SIKA CORPORATION
 - *EMACO P22 - FLEXIBLE CEMENTITIOUS REBAR COATING" BY MASTER BUILDERS TECHNOLOGY
 - OR APPROVED EQUAL
 - FOLLOW SUPPLIERS INSTRUCTIONS FOR SURFACE PREPARATION, MIXING, APPLICATION, TEMPERATURE LIMITATIONS, CURING TIME, ETC.
- EXISTING CONCRETE SHALL BE CLEAN AND FREE OF LOOSE PARTICLES, DUST, OIL, GREASE AND OTHER FOREIGN MATERIALS THAT WOULD PREVENT BONDING OF THE NEW CONCRETE.
- THE TEMPERATURE OF THE EXISTING SLAB SHALL BE WITHIN 10 DEGREES FAHRENHEIT OF THE TEMPERATURE OF THE CONCRETE MIX AT THE TIME THE NEW CONCRETE IS BEING PLACED.
- THOROUGHLY WET THE SURFACE OF THE REPAIR AREAS AND ALLOW THE SURFACE TO DRY BEFORE PROCEEDING. BROOM A THIN COAT OF BONDING GROUT ONTO THE SURFACE OF THE REPAIR AREA. PREVENT PUDDLING OF THE GROUT. THIN THE GROUT AND PAINT ON VERTICAL SURFACES.

SILICA FUMED BONDED CONCRETE OVERLAY: WORK ITEM #3

- SAW CUT AND REMOVE EXISTING PILE SUPPORTED CONCRETE SLAB TO THE EXTENT SHOWN ON PLANS.
- REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES.
- INSTALL NEW BONDED CONCRETE SLAB OVERLAY AND PREPARE SURFACE PER DETAILS ON SHEET S2.0
- APPROVED CONCRETE BONDING AGENT PRODUCT LISTED BELOW:
 - *ARMATEC 110 EPOCEM BONDING AGENT/ ANTI-CORROSION COATING "BY SIKA CORPORATION
 - *CONCRESE LIQUID LPL "BY BASF "
 - OR APPROVED EQUAL
 - FOLLOW SUPPLIERS INSTRUCTIONS FOR SURFACE PREPARATION, MIXING, APPLICATION, TEMPERATURE LIMITATIONS, CURING TIME, ETC.
- REFER TO DESIGN CRITERIA NOTES (A. CONCRETE) FOR ADDITIONAL INFORMATION
- AT THE OWNER'S EXPENSE AN INDEPENDENT TESTING LABORATORY SHALL BE EMPLOYED TO PERFORM COMPRESSION STRENGTH TESTING (AT 3, 7 AND 28 DAYS) ON THE CONCRETE AND PATCH MATERIAL. CYLINDERS IN ACCORDANCE WITH ASTM C31 AND ASTM C39. THE CONTRACTOR SHALL PREPARE AT LEAST ONE SET OF FOUR TEST CYLINDERS FOR EACH DAY'S POUR IN EXCESS OF ONE CUBIC YARD FOR EACH TYPE OF CONCRETE. IF A DAY'S POUR EXCEEDS 25 CUBIC YARDS, AN ADDITIONAL SET OF CYLINDERS SHALL BE PREPARED FOR EACH ADDITIONAL 50 CUBIC YARDS OR FRACTION THEREOF. TEST CYLINDERS SHALL BE STD. 6" DIAMETER USED FOR CONCRETE COMPRESSION TEST AND PREPARE IN ACCURACIES WITH ASTM C31 AND ASTM C172.
- FINISH OF OVERLAY TO BE SMOOTH AND SIMILAR TO THAT FOUND OF THE EXISTING TOPPING. OWNER TO APPROVE FINISH PRIOR TO POURING CONCRETE. OVERLAY AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 306R AND ACI 306R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
- CURE CONCRETE BY COVERING WITH WET BURLAP AND THEN COVERING THE BURLAP WITH 6 MIL. POLYETHYLENE FILM. PLACE BURLAP AS SOON AS THE CONCRETE CAN SUPPORT THE BURLAP WITHOUT DEFORMATION. TAPE JOINTS IN POLYETHYLENE. KEEP THE BURLAP CONTINUOUSLY WET FOR AT LEAST 3 DAYS
- ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HERE IN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

HORIZONTAL SHALLOW DEPTH SPALL REPAIR: WORK ITEM #4

- REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES. SEE DETAILS SHEET S2.0
- SHALLOW DEPTH REPAIRS TO THE EXISTING STRUCTURAL SLAB SHALL BE FILLED WITH, AND INCLUDED IN THE NEW FULLY BONDED TOPPING SLAB.
- PROVIDE A UNIT COST ON BID FORM FOR PER SQUARE FOOT, PER TWO INCH AVERAGE DEPTH OF ADDITIONAL CONCRETE REMOVAL. SEE WORK ITEM #9 FOR QUANTITIES AND INSPECTION

OVERHEAD SPALL REPAIR: WORK ITEM #5

- (TROWEL APPLIED OR FORMED AND POURED)
- (INCLUDES ALL VERTICAL AND OVERHEAD SURFACE REPAIRS REPAIRS)
- REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES. SEE DETAILS SHEET S2.0
 - PATCH THE REPAIR AREA WITH THE FOLLOWING MATERIALS:
 - *SIKATOP 123 -- OVERHEAD AND VERTICAL REPAIR MORTAR" BY SIKA CORPORATION.
 - *EMACO R350 - POLYMER MODIFIED, LIGHTWEIGHT VERTICAL AND OVERHEAD REPAIR MORTAR" BY MASTER BUILDERS TECHNOLOGIES.
 - APPROVED EQUAL.
 - PATCH MATERIAL SHALL BE PLACED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS REGARDING SURFACE PREPARATION, MIXING, PLACEMENT AND FINISH, CURING, TEMPERATURE LIMITATIONS, ETC. CONCRETE, USE MIX AS PER NOTE FOR OVERHEAD REPAIR PATCHES DEEPER THAN 1-1/2". APPLY PATCH MATERIAL IN MORE THAN ONE LIFT AS RECOMMENDED BY THE MANUFACTURER. ALL FORMING SHALL CONFORM TO THE PROFILE OF THE EXISTING STRUCTURE.
 - FINISH ON THE PATCH SHALL BE COMPATIBLE WITH AND MATCH SMOOTHNESS OF SURROUNDING CONCRETE. PATCH AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 306R AND ACI 306R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
 - ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HERE IN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.
 - PROVIDE A UNIT COST ON BID FORM FOR PER SQUARE FOOT, PER TWO INCH AVERAGE DEPTH OF ADDITIONAL CONCRETE REMOVAL. SEE WORK ITEM #9 FOR QUANTITIES AND INSPECTION.

REINFORCING STEEL BAR REPLACEMENT: WORK ITEM #6

- WHERE REINFORCING STEEL BARS HAVE BEEN DETERMINED BY THE ENGINEER TO REQUIRE REPLACEMENT, REFER TO TABLE SHEET S1.0 FOR REINFORCING BAR LAP SPLICE DEVELOPMENT LENGTHS. WHERE EXOPY COATED REINFORCING BARS ARE USED, USING MULTIPLYING FACTOR OF 1.2
- PROVIDE A UNIT COST ON BID FORM PER POUND OF REINFORCING STEEL BARS. SEE WORK ITEM #9 FOR QUANTITIES AND INSPECTION.

FLOOR DRAIN: ITEM #7

- REMOVE AND REPLACE TWO EXISTING FLOOR DRAINS AS PER PLAN, INCLUDING CONNECTIONS TO EXISTING DRAIN LEADERS TO MEET CURRENT GOVERNING CODES.
- MECHANICAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INCLUDING DRAIN LEADER SIZES, LOCATIONS, AND CLEAN OUT LOCATIONS.
- ENLARGE EXISTING SLAB AT DRAIN LOCATIONS AS REQUIRED FOR THE INSTALLATION OF NEW 12" DIAMETER HEAVY-DUTY FLOOR DRAINS AT THE PROPOSED ELEVATIONS SHOWN ON PLANS. NOTIFIED ENGINEER WITH ANY DISCREPANCIES.
- APPROVED FLOOR DRAIN PRODUCT LISTED BELOW:
 - ZURN Z541 BY ZURN INDUSTRIES: WITH THE FOLLOWING
 - GALVANIZED CAST IRON
 - DURESIST GRATE
 - SEDIMENT BUCKET W/ STAINLESS MESH LINER
 - OR APPROVED EQUAL

CONCRETE ADMIXTURE: ITEM #8

- CRYSTALLINE CAPILARY WATERPROOFING ADMIXTURE SHALL BE BATCHED AT THE PLANT FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS FOR PERCENTAGE OF ADMIXTURE TO MASS OF CEMENT RATIOS.
- APPROVED CONCRETE ADMIXTURE PRODUCTS LISTED BELOW:
 - *RHEOMAC 300D "BY BASF"
 - OR APPROVED EQUAL
 - FOLLOW SUPPLIERS INSTRUCTIONS FOR SURFACE PREPARATION, MIXING, APPLICATION, TEMPERATURE LIMITATIONS, CURING TIME, ETC.

QUAUNTITIES AND INSPECTION: ITEM #9

- PROVIDE A UNIT COST FOR EACH ITEM LISTED BELOW ON BID FORM
 - SHALLOW DEPTH REPAIR (2" ASSUMED AVERAGE DEPTH) -SEE WORK ITEM #4. ASSUMED QUANTITY =50 SQ. FT.
 - OVERHEAD SPALL REPAIR (2" ASSUMED AVERAGE DEPTH) -SEE WORK ITEM #5. ASSUMED QUANTITY =10 SQ. FT.
 - REINFORCING STEEL BAR REPLACEMENT (PER LB) -SEE WORK ITEM #6. ASSUMED QUANTITY =50 LBS.
 - STEEL BEAM FLANGE REPAIR (PER LINEAL FEET) -SEE DETAILS S2S2.0 AND B2S2.0. ASSUMED QUANTITY ~2 L.F.
- THE CONTRACTOR IS RESPONSIBLE FOR DELINEATING AND FIELD MARKING PROPOSED QUANTITIES FOR REVIEW AND APPROVAL OF THE ENGINEER PRIOR TO REMOVAL OF MATERIAL. THE CONTRACTOR SHALL PROVIDE UNIT COSTS FOR EACH ITEM LISTED ABOVE.
- AFTER WORK ITEMS HAVE BEEN DEFINED, ADDITIONAL QUANTITIES MUST BE CALCULATED JOINTLY BY REPRESENTATIVE OF THE CONTRACTOR AND THE OWNER PRIOR TO ANY INSTALLATION OF NEW REPAIR MATERIALS. THESE QUANTITIES WILL BE THE SOLE BASIS FOR PAYMENT TO THE CONTRACTOR.
- EXPOSED REPAIR WORK MUST BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO ANY INSTALLATION OF NEW REPAIR MATERIALS.

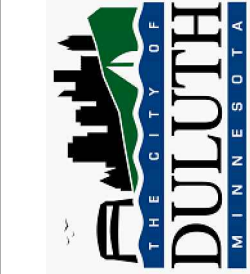
NOTES:

- NOTATIONS:
 - db : NOMINAL BAR DIAMETER (INCHES)
 - L_d : TENSION DEVELOPMENT LENGTH (INCHES) FOR REINFORCEMENT SATISFYING THE FOLLOWING REQUIREMENTS:
SLABS AND WALLS: CLEAR SPACING > 2 db, AND CONC. CLEAR COVER > db
BEAMS AND COLUMNS: CLEAR SPACING > db, AND CONC. CLEAR COVER > db
 - L_t : DEVELOPMENT LENGTH OF TOP BARS IN TENSION = 1.3 x L (INCHES)
 - L_b : DEVELOPMENT LENGTH OF BARS OR DOWELS IN COMPRESSION = 19 x db (INCHES)
 - L_c : TIED COLUMN LAP SPLICE IN COMPRESSION = 30 x db (INCHES)
 - L_{cs} : SPIRAL COLUMN LAP SPLICE IN COMPRESSION = 22.5 x db (INCHES)
 - L_{st} : TENSION LAP SPLICE LENGTH FOR OTHER THAN TOP BARS = 1.3 x L (INCHES)
 - L_{str} : TENSION LAP SPLICE LENGTH OF TOP BARS = 1.7 x L (INCHES)
- MULTIPLY VALUES IN THE TABLE BY 1.5 IF CLEAR SPACING OR CONCRETE COVER DO NOT MEET THE REQUIREMENTS FOR LD IN NOTE 1.
- MULTIPLY VALUES IN THE TABLE BY 1.3 EPOXY COATED REINFORCEMENT STEEL
- TOP BARS: HORIZONTAL BEAM REINFORCING WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW.
- THE DEVELOPMENT AND SPLICE LENGTHS ARE BASED ON REINFORCEMENT STRENGTH Fy = 60 KSI
- #14 AND #18 BARS SHALL NOT BE LAP SPLICED. SEE GENERAL NOTES.
- MULTIPLY VALUES IN THE TABLE BY 1.33 FOR USE WITH LIGHTWEIGHT AGGREGATE CONCRETE.

CONCRETE				
f'c = 4,000 PSI				
BAR SIZE	L _d	L _t	L _b	L _{str}
#3	15	20	20	26
#4	19	25	25	33
#5	24	32	32	42
#6	29	38	38	50
#7	42	55	55	72
#8	48	63	63	82
#9	54	71	71	93
#10	61	80	80	104
#11	67	88	88	115
#14	81	106	-	-
#18	108	141	-	-

CONCRETE			
ALL STRENGTHS			
BAR SIZE	L _d	L _t	L _{cs}
#3	8	12	12
#4	10	15	12
#5	12	19	14
#6	15	23	17
#7	17	26	20
#8	19	30	23
#9	22	34	26
#10	24	38	29
#11	27	42	32
#14	33	-	-
#18	43	-	-

1
S1.0 TYPICAL REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH TABLES
NOT TO SCALE



Project Name:
**CITY OF DULUTH
FIRE STATION #10
2013 SLAB REPLACEMENT / RENOVATION
1106 COMMONWEALTH AVE., DULUTH, MN.**

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Signature: *Jon E. Lamont*
Engineer: Jon E. Lamont
Reg. #: 24838

NCE Project # 13-267

Date: August 30, 2013

Drawn By: GDB

Checked By: JEA

Revisions:

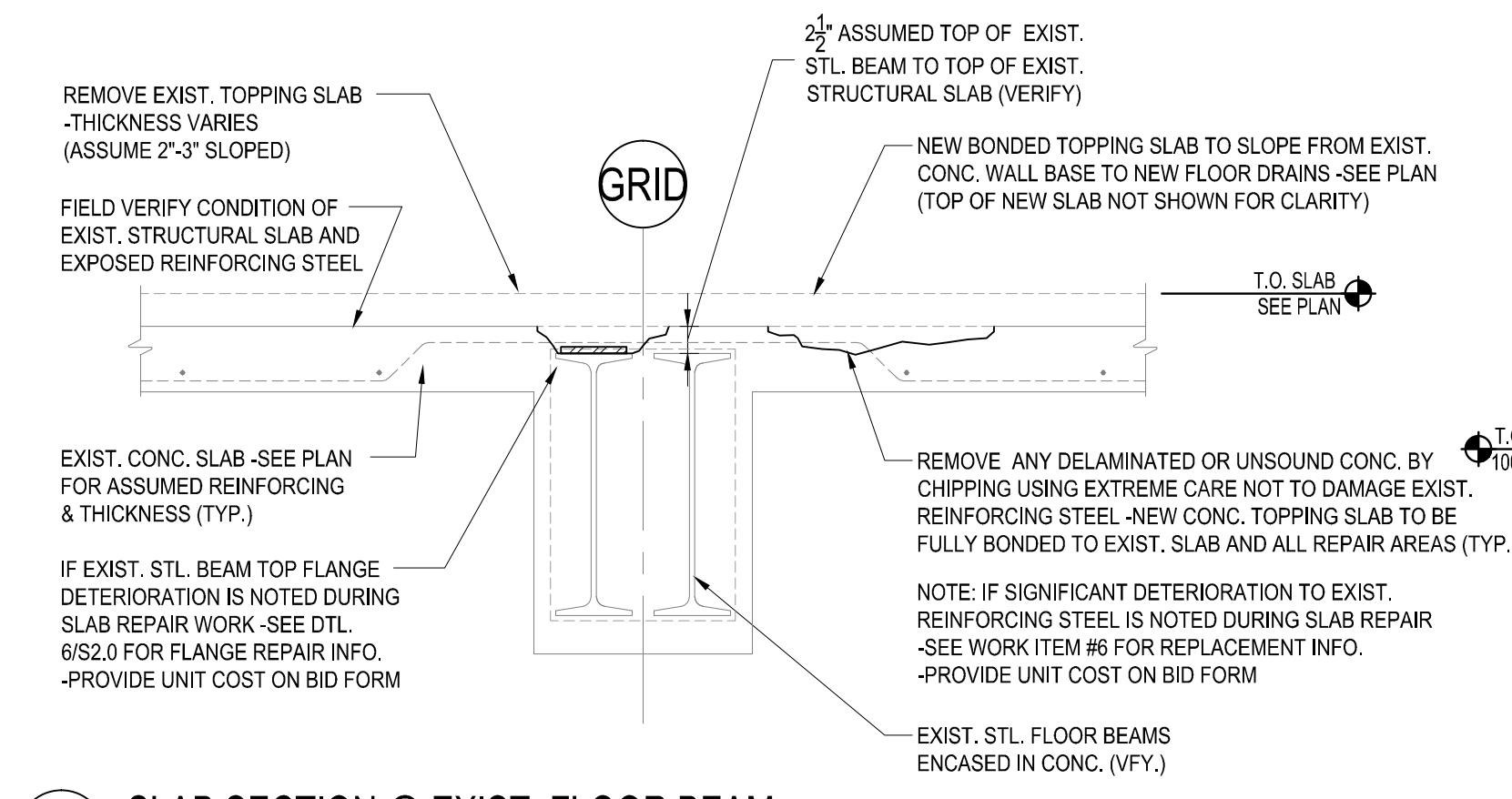
STRUCT. NOTES
SHEET INDEX

sheet
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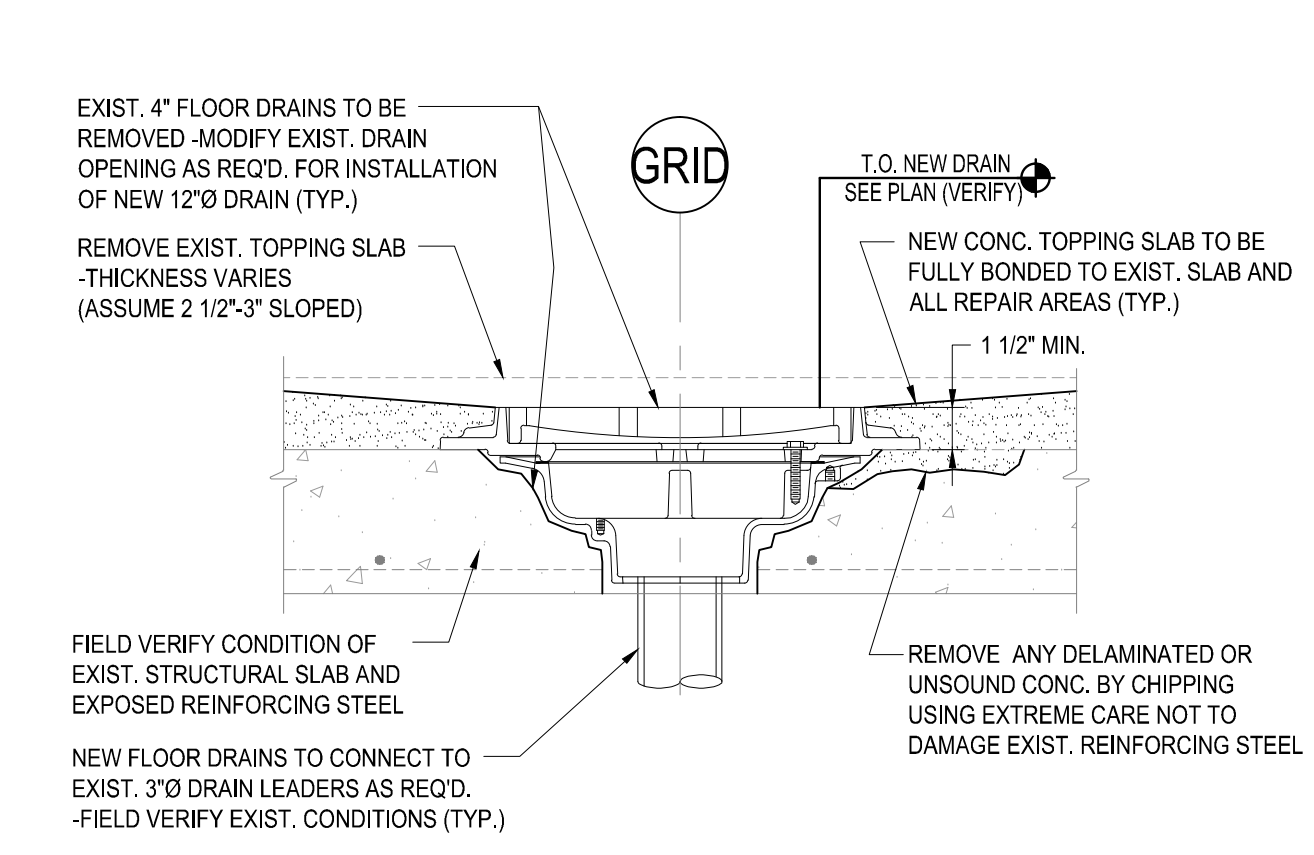
STRUCTURAL SHEET LIST

S1.0	STRUCTURAL NOTES / SHEET INDEX
S2.0	FIRST FLOOR REPAIR PLAN / SECTIONS AND DETAILS
S2.1	BASEMENT / CEILING REPAIR PLAN

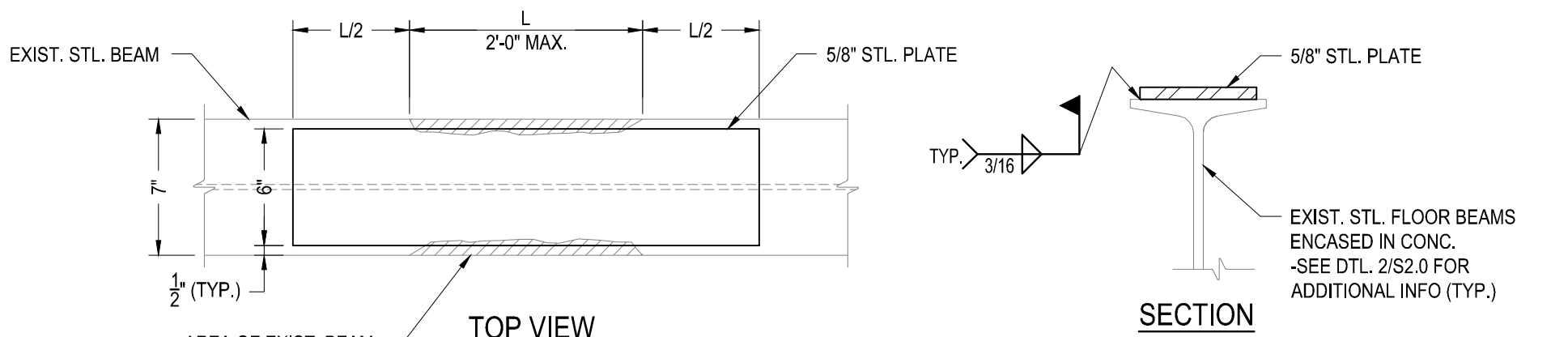
S1.0



2
S2.0
SLAB SECTION @ EXIST. FLOOR BEAM
3/4"=1'-0"

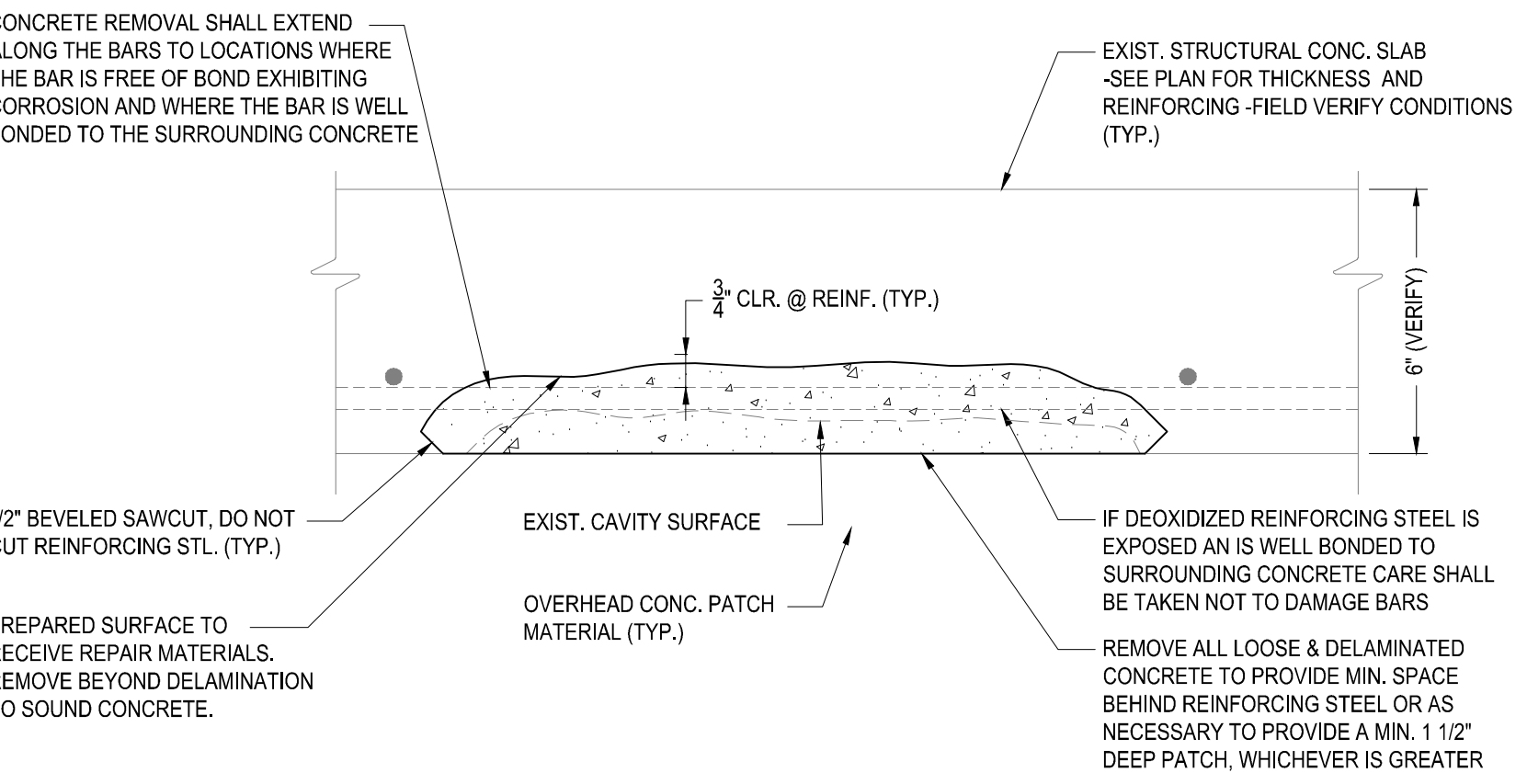


4
S2.0
SLAB SECTION @ FLOOR DRAIN
1 1/2"=1'-0"

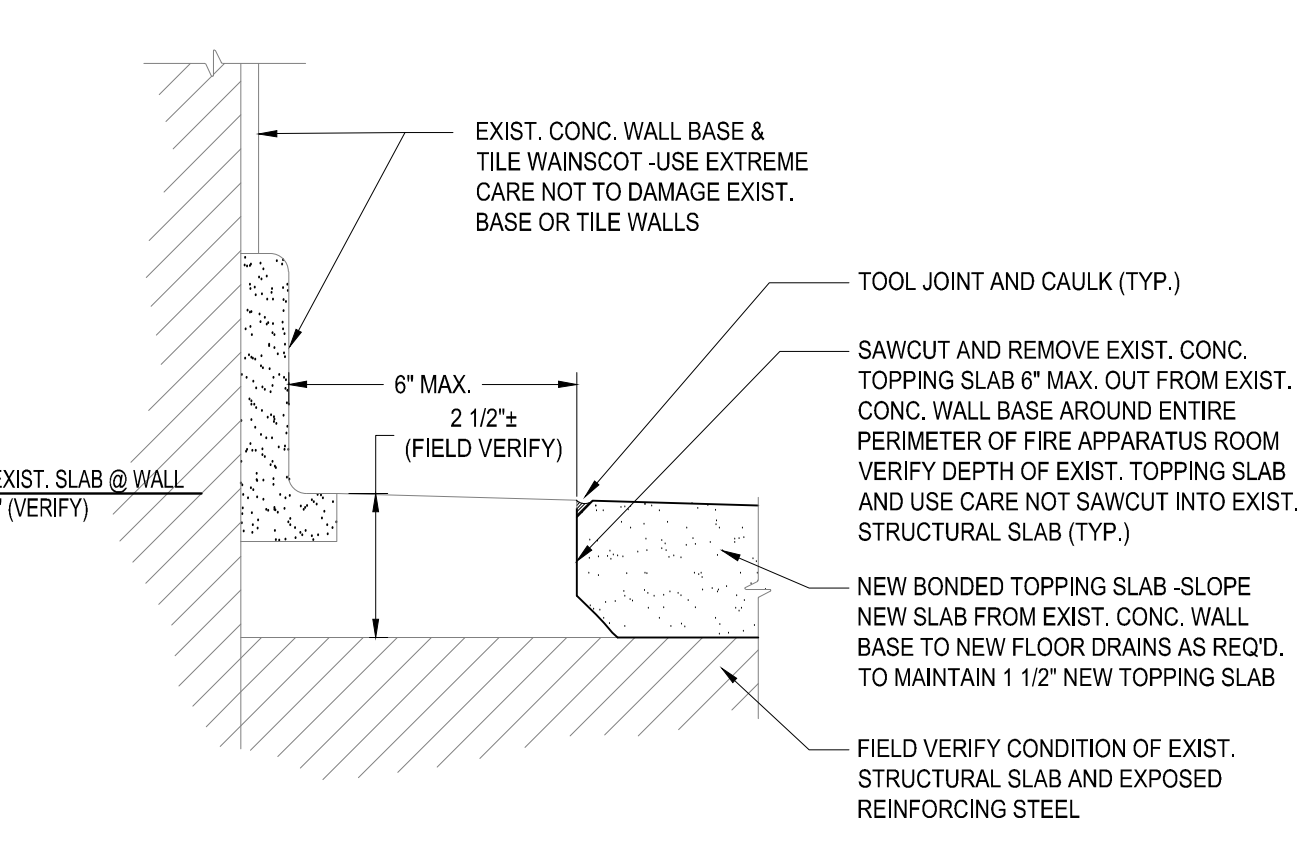


1. NOTIFY ENGINEER OF RECORD TO VERIFY THE AMOUNT OF REPAIR REQUIRED OR IF TOP FLANGE DETERIORATION EXCEEDS MAXIMUM LIMITS SHOWN IN DETAILS OR IF THERE IS ANY BEAM WEB DETERIORATION PRESENT.
2. PROVIDE UNIT COST ON BID FORM FOR LINEAL FEET OF BEAM FLANGE REPAIR

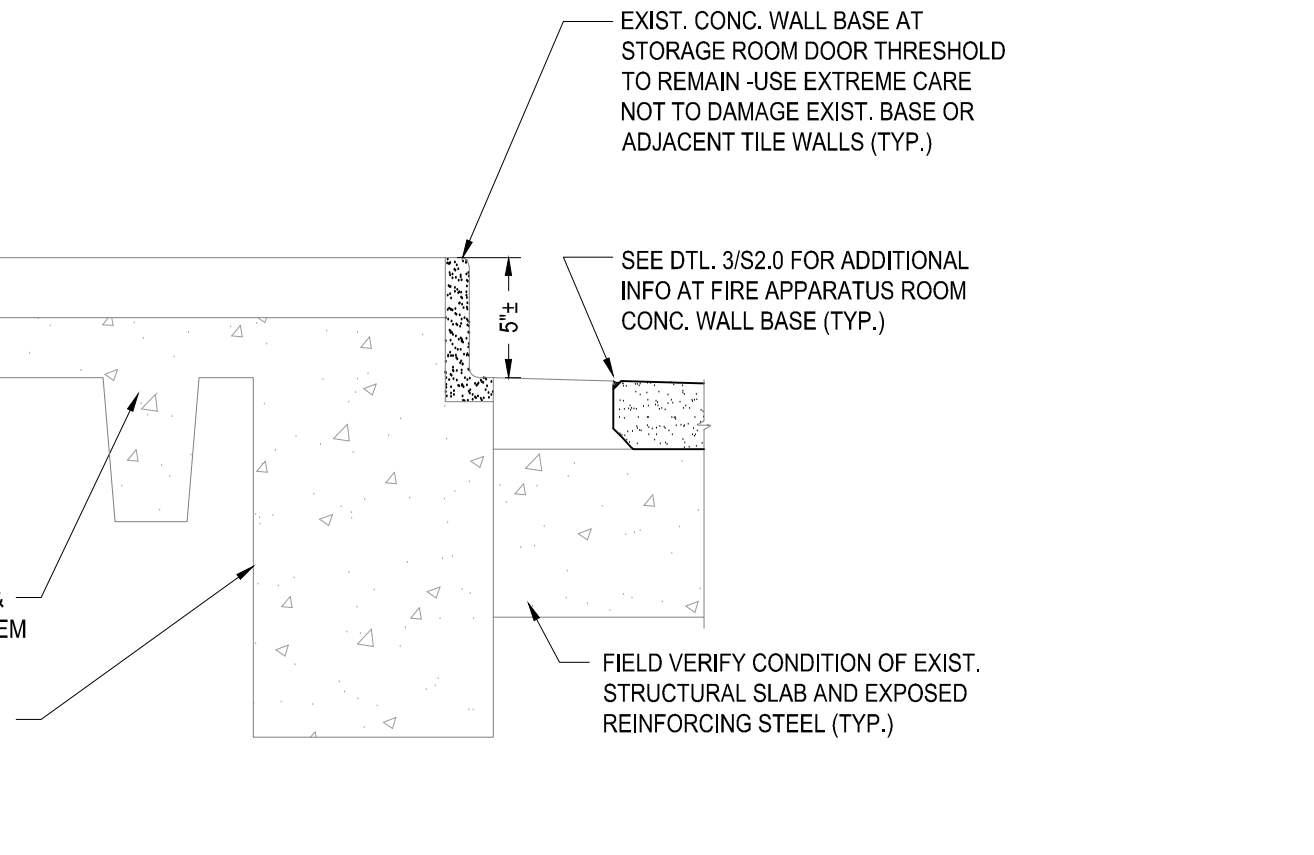
6
S2.0
BEAM FLANGE DETERIORATION REPAIR
1 1/2"=1'-0"



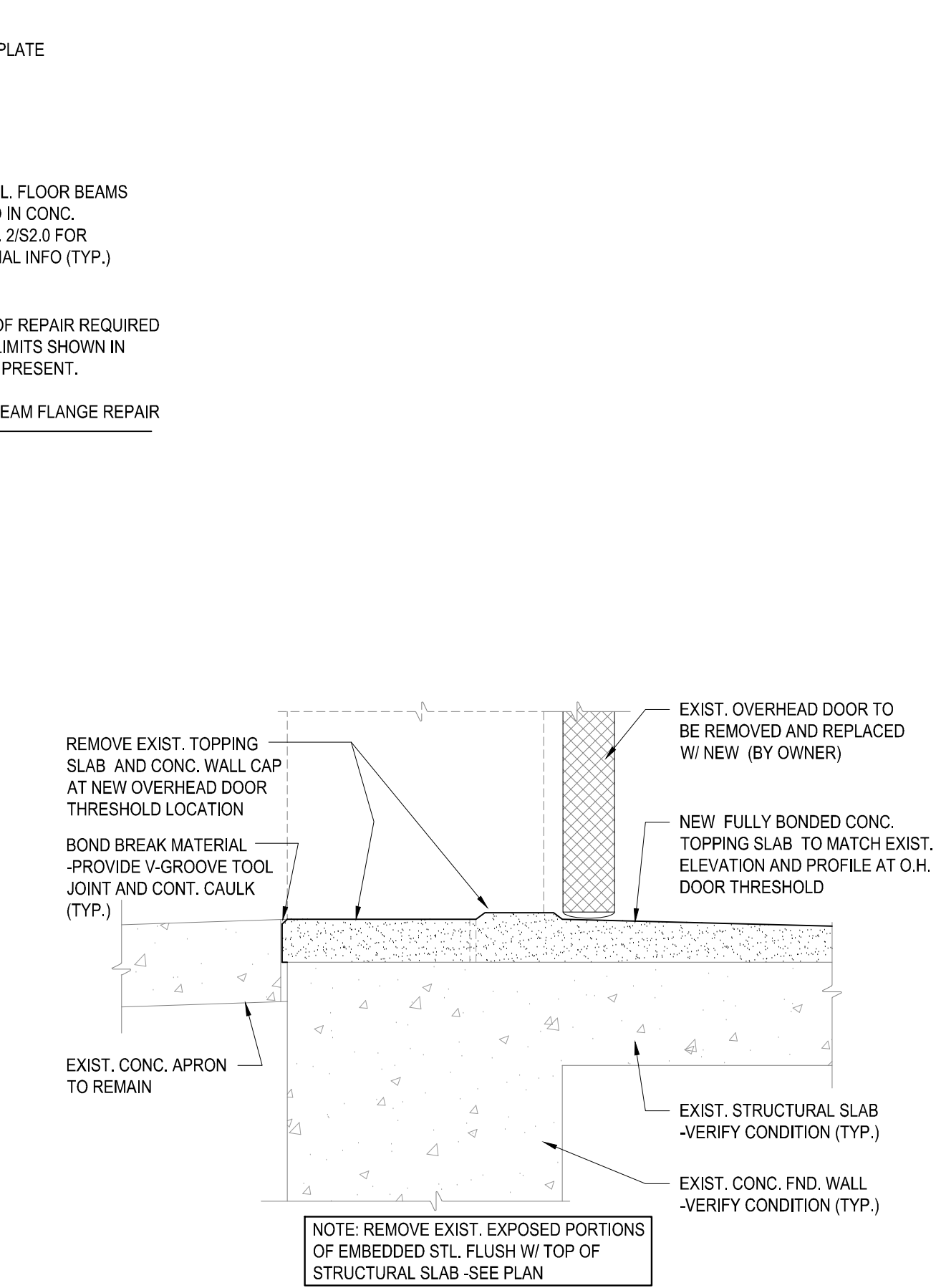
7
S2.0
TYPICAL OVERHEAD SPALL REPAIR
3"=1'-0"



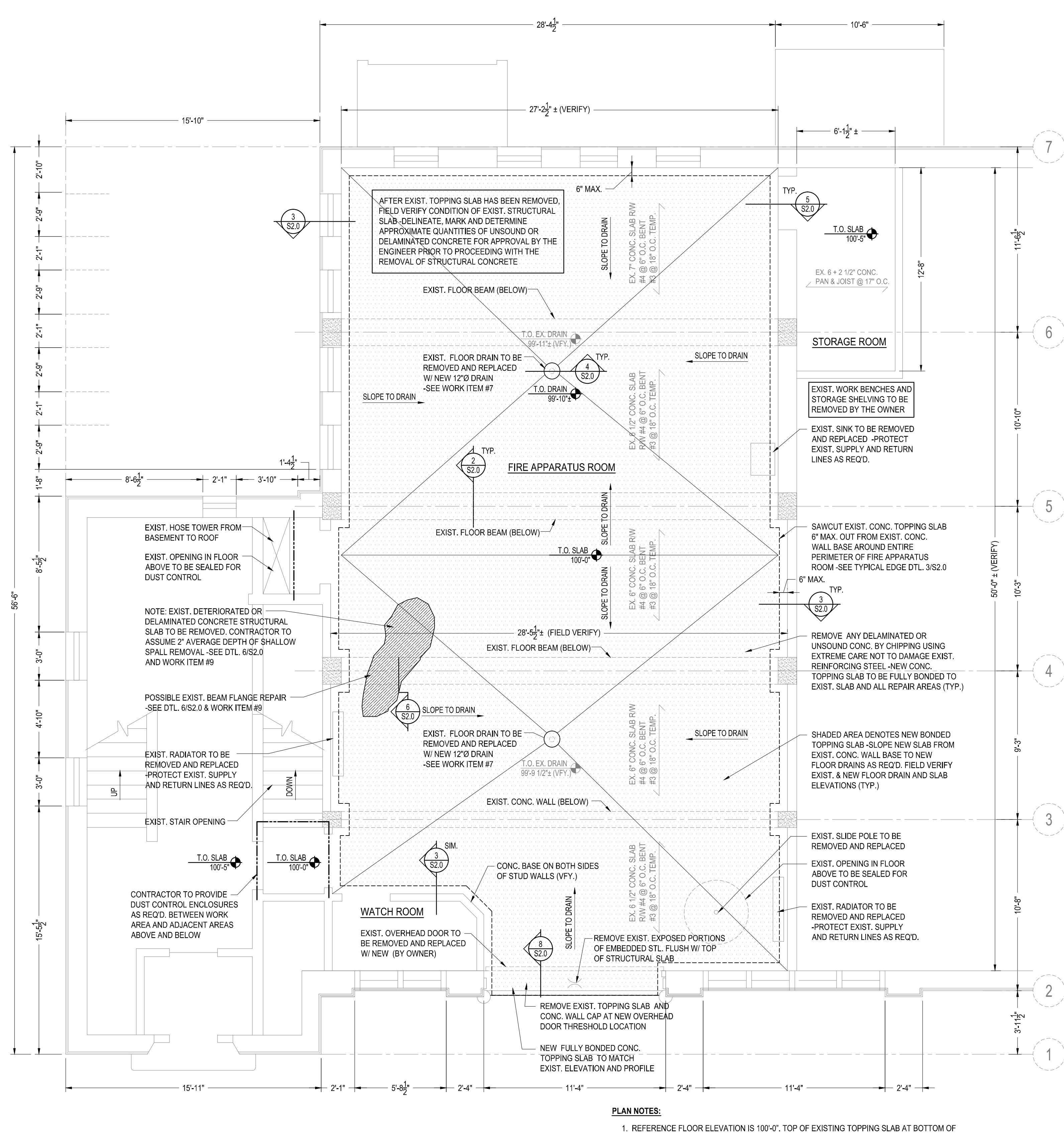
3
S2.0
TYPICAL SECTION @ EXIST. WALL BASE
3"=1'-0"



5
S2.0
SLAB SECTION @ FLOOR STEP
1 1/2"=1'-0"



8
S2.0
SLAB SECTION @ OVERHEAD DOOR
1 1/2"=1'-0"



2
S2.0
FIRST FLOOR REPAIR PLAN
1/4"=1'-0" (FIRE APPARATUS ROOM)

- PLAN NOTES:**
1. REFERENCE FLOOR ELEVATION IS 100'-0". TOP OF EXISTING TOPPING SLAB AT BOTTOM OF CONCRETE WALL BASE. NEW BONDED TOPPING SLAB ELEVATION AS SHOWN ON PLANS.
 2. EXISTING TOPPING SLAB TO BE REMOVED IS ASSUMED TO BE 2" TO 3" DEEP AND IS NOT BONDED TO THE EXISTING STRUCTURAL SLAB. BASED ON CORE SAMPLES PROVIDED BY AMERICAN ENGINEERING & TESTING. REPORT # 99-7026, DATED 10-19-1997. THIS REPORT SHALL BE AVAILABLE FROM NORTHLAND CONSULTING ENGINEERS. PRIOR TO SAW CUTTING FLOOR ALONG WALL BASE, THE CONTRACTOR SHALL FIELD VERIFY DEPTH OF EXISTING TOPPING SLAB NEAR OUTER WALLS TO DETERMINE DEPTH OF SAWCUT REQUIRED WITHOUT DAMAGING THE EXISTING STRUCTURAL SLAB BELOW.
 3. FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. NOTIFY ENGINEER WITH ANY DISCREPANCIES.
 4. CONTRACTOR TO PROVIDE DUST CONTROL ENCLOSURES AS REQ'D. BETWEEN WORK AREA AND ADJACENT AREAS ABOVE AND BELOW.

Northland
Consulting Engineers L.L.P.

Structural, Civil and Forensic Engineering Services

www.nce-engineers.com

CITY OF DULUTH
FIRE STATION #10
2013 SLAB REPLACEMENT / RENOVATION
1106 COMMONWEALTH AVE., DULUTH, MN.

Project Name:

City of Duluth Fire Station #10

2013 Slab Replacement / Renovation

1106 Commonwealth Ave., Duluth, MN.

Signature: *Jon E. Lamott*

Engineer: Jon E. Lamott

Reg. #: 24533

NCE Project # 13-267

Date: August 30, 2013

Drawn By: GDB

Checked By: JEA

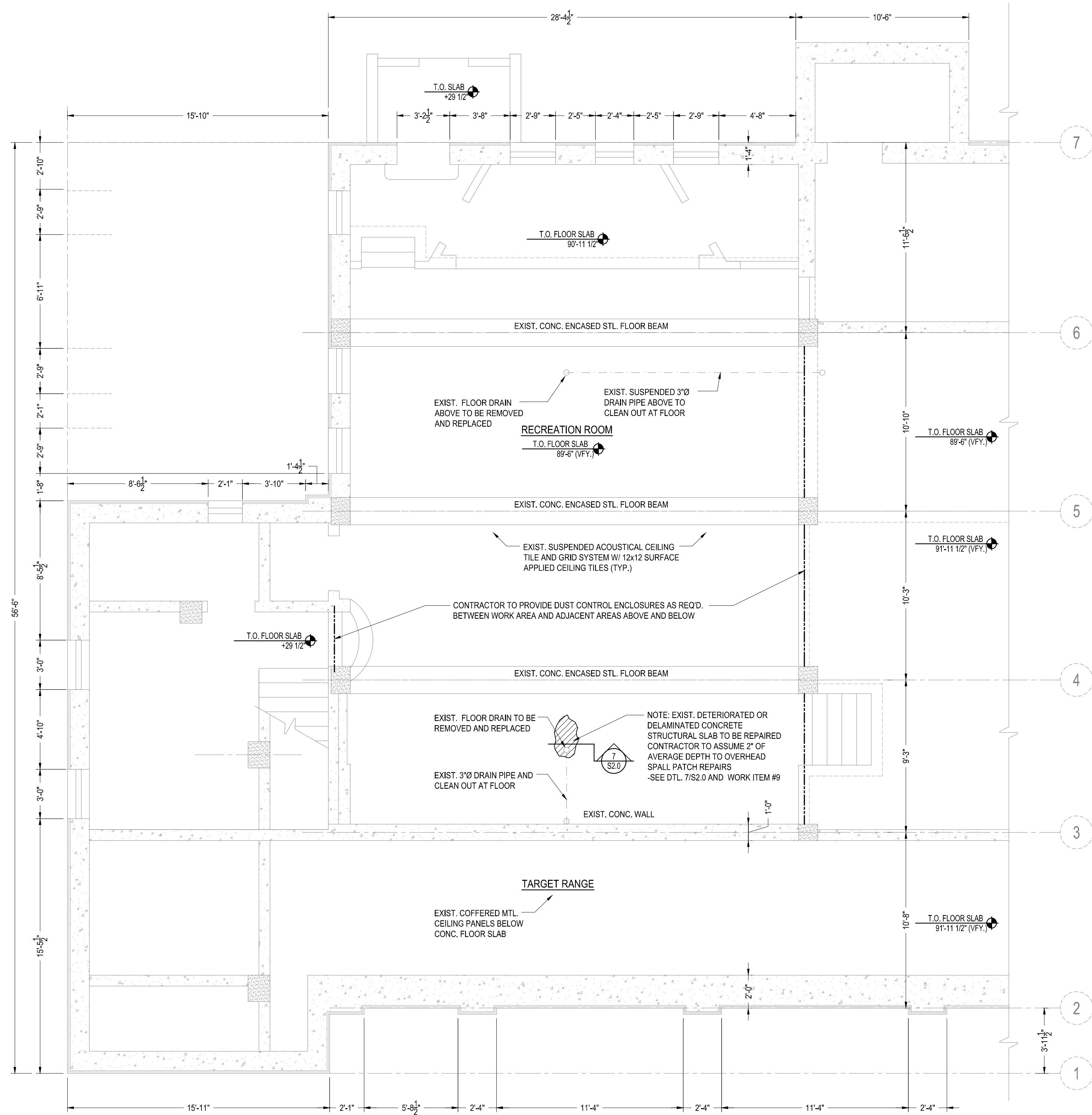
Revisions:

NO.	DESCRIPTION

sheet title

sheet number

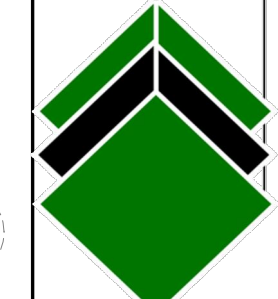
S2.0




1
S2.1

BASEMENT / CEILING REPAIR PLAN
1/4"=1'-0" (RECREATION ROOM)

 NORTH



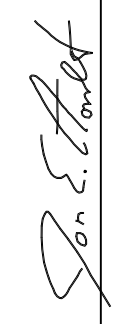
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DULUTH

Project Name:
**CITY OF DULUTH
FIRE STATION #10
2013 SLAB REPLACEMENT / RENOVATION
1106 COMMONWEALTH AVE., DULUTH, MN.**

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature: 
Engineer: Jon E. Aamodt
Reg. #: 24533

NCE Project # 13-267
Date: August 30, 2013
Drawn By: GDB
Checked By: JEA

Revisions:

NO.	DESCRIPTION

**BASEMENT/
CEILING
REPAIR PLAN**

sheet
title
sheet
number

S2.1